



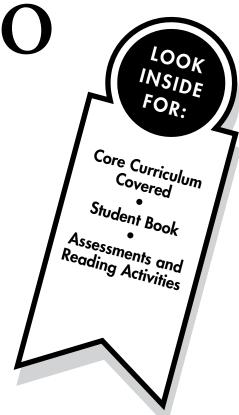


Animals and Plants in Their Environment

Adapting to

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What roles do plants and animals play in their environments?

CORE CURRICULUM STATEMENTS

Individual organisms and species change over time.

Individuals within a species may compete with each other for food, mates, space, water, and shelter in their environment.

All individuals have variations, and because of these variations, individuals of a species may have an advantage in surviving and reproducing.

Organisms maintain a dynamic equilibrium that sustains life.

Senses can provide essential information (regarding danger, food, mates, etc.) to animals about their environment.



On Level



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Life Science

Animals and Plants in Their Environment

Adapting to Survive

by Linda Barr





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Table of Contents

	Introduction:
•	Survivors!
dapting Survive	Chapter 1: Adaptations for Climate
Journiculus Barts Chool lice	Chapter 4: Adaptations to Reproduce19 Glossary

- Predict -What do you think you will learn from this book?

INTRODUCTION

Survivors!

Could you survive in the Arctic for the rest of your life? Maybe, but first you would have to use special clothes and equipment to stay warm. Yet some animals, such as polar bears, thrive in the Arctic.

You could survive in the desert, too, but you would have to have to find ways to deal with desert conditions. Still, scorpions can meet all of their needs in the desert despite its heat and dryness.

Plants and animals are **adapted** to where they live. Their bodies and behaviors must match their **ecosystem**, or they will not be able to meet their needs and survive.

What are the needs of plants and animals? Somehow, they must get enough energy to live and grow. That means sunlight for plants and food for animals. Organisms also need water, oxygen from the air, and shelter. Plus, they need enough space to live and a way to get rid of their wastes.

In this book, you will learn how populations of living things have adapted to their ecosystems so they can meet all of their needs. Of course, an organism that is adapted to the Arctic would have difficulty surviving in the warm, wet rain forest. Like you, plants and animals are adapted to certain ecosystems. They might die in other ones.

adapted: changed in order to fit a certain purpose **ecosystem:** all the living things that live in a certain area

Apply –
 What kind of ecosystem are you adapted to?
 Where can you live most easily?

CHAPTER 1

Adaptations for Climate

Plants and animal populations that live in very cold, hot, dry, or wet **climates** adapt in many ways to their ecosystems. For example, polar bears have two layers of fur and a layer of fat 4.5 inches thick to keep them warm in their cold climate. Their small ears allow little heat to escape from their bodies. Penguins also have a thick layer of fat. They can fluff out their feathers to trap air. Then their feathers act like a blanket to keep them warm.

To survive in cold places. plants are

To survive in cold places, plants grow low to the ground to stay out of the wind. These plants tend to be small and grow quickly because the soil is poor and the growing season is short.

climate: the weather year-round

Ecosystems and Their Climates

In the desert, animals must survive with high heat. Here, many animals live in tunnels underground and come out only at night, when it's cooler. The jackrabbit's very large ears let its body release heat into the air.

In the desert, animals must survive with little water. Snakes and lizards have scales to help reduce water loss. Some animals obtain all the water they need only from the plants they eat.

Desert plants store water in their leaves, stems, and roots. To reduce water loss, many cactus plants don't have any leaves. Instead, cells in their stems use sunlight to produce food energy. Most desert plants have a waxy surface that helps slow water evaporation.

– Infer –

Why do polar bears have small ears while jackrabbits have very large ears?

The rain forest is warm and wet. You might think that organisms need no adaptations to live here. Thousands of animals live in the rain forest, however many of them never set foot on the ground. That's where many **predators** roam. Food and safety are in the trees, so many animals are adapted to living there.

Life is not easy for rain forest plants, quickly absorb the nutrients from decaying plant and animal matter. The trees grow so close together that by block sunlight from reaching tr. To get ency 1

they block sunlight from reaching the forest floor. To get enough sunlight, plants closer to the ground grow very wide leaves, and vines climb up tree trunks.

Migration

Many ecosystems are warm in the summer and cold in the winter. As the temperature drops, food and water become harder to find. To survive the winters, some animals migrate.

Many types of birds, ducks, whales, and insects migrate to warmer places. Monarch butterflies travel up to 1,800 miles. Some fly from Canada all the way to forests in Mexico. Gray whales swim as far as 6,200 miles. They migrate from the icy coast of Alaska to warmer waters off Mexico. Many types of whales have their babies where it's warm.

In the spring, these animals head back north. Now food and water are easier to find there.

predators: animals that get their energy by eating other animals

migrate: to move south for the winter and then return north in the spring

Hibernation

Others animals **hibernate** to survive the winter. First, they eat as much as possible. They are storing energy in their body fat. During true hibernation, the animal's body temperature drops. Its heart beats more slowly. Its breathing rate drops, too. A woodchuck's body temperature drops from 98 degrees Fahrenheit (37 degrees Celsius), to only 38°F (3°C). Its heart rate drops from 80 beats a minute to 4 or 5. Other true hibernators include ground squirrels and bats.

Some animals go into a deep sleep during the coldest months. They are not hibernating.

Their bodies slow down, but not as much as hibernating animals. These animals wake up from time to time and eat. This group tincludes bears, skunks, and raccoons.

– Differentiate – Why aren't bears true hibernators?

hibernate: to become inactive, with much slower body functions

CHAPTER 2

Adaptations to Find and Eat Food

Body Parts

Large birds have sharp eyesight that helps them spot their **prey**. For example, a falcon can see a chipmunk from nearly a mile away. A box jellyfish cannot see nearly as far, but it has 24 eyespots to locate its prey.

Many animals have a strong sense of smell that helps them find food. The part of your body that helps you smell a pizza covers only 0.6 square inches inside your head. In dogs, this body part covers more than 23 square inches, so it's no wonder they have a better sense of smell.

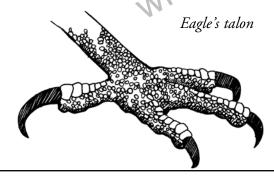
Catfish use their whiskers to find food. Butterflies have taste buds on their feet, while earthworms have taste buds all over their bodies.

prey: animals that are eaten by other animals

After cheetahs spot their prey, they use their long, strong legs to run up to 70 miles an hour. They can run this fast for only a short time, but long enough to catch most prey.

Long legs help herons and other birds wade in shallow water, hunting for fish. Webbed feet help frogs and ducks swim faster than their prey. Frogs also have long Bears, lions, and other meat-eaters have ong claws and long, sharp teeth to tear apart their pro tongues to catch insects. Most birds have wings that allow them to swoop down on their prey. Some, such as eagles, use talons to grab their food before it gets away.

strong claws and long, sharp teeth to catch and tear apart their prey.



talons: claws on the feet of meat-eating birds

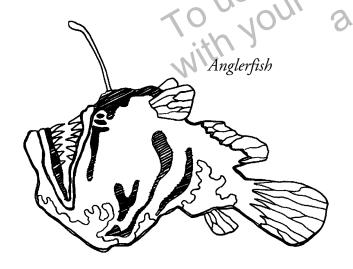
The shape of a bird's beak depends on what it eats. An eagle's sharp, curved beak helps it tear apart fish. Insect-eaters, such as woodpeckers, have short thin beaks for reaching into cracks in tree bark. Seedeaters, such as cardinals, have short, thick beaks for cracking seeds. Hummingbirds have long, thin beaks for sipping nectar from flowers. Pelicans' bills have large pouches for storing the fish they catch.

The anteater has a special tongue. It can jab its long tongue into an ant nest 150 times a minute—faster than the ants can run away. Its tongue is sticky and covered with barbs that trap the ants. A giant anteater can eat 30,000 insects in one day!

- Infer -

Birds have different kinds of beaks. Do you think animals have different kinds of teeth? Why or why not? Fish in the deep, dark ocean have parts that help them find and eat their food, too. Some make their own light to find food. For example, the anglerfish has a fin on its head that works like a fishing pole and dangles lighted "bait" in front of the anglerfish's mouth. When a small fish comes to eat the "bait," the anglerfish eats the fish instead.

The gulper eel, which lives a mile under the ocean's surface, is almost all mouth and can stretch open its huge jaws to eat a fish almost as big as it is. This eel can grow up to six feet long!



Behaviors

Some animals have behaviors that help them meet their need for food. For example, hyenas hunt in packs. A group of them will work together to separate a weak animal, such as a young antelope, from its herd and bring it down.

Bats make sounds that echo back to them. They use these echoes like radar to find tiny insects up to 18 feet away.

Tickbirds find their food by getting friendly with large grazing animals, such as cattle. They pick ticks off the cattle's skin. The birds get a meal, and the cattle get rid of the ticks.

Squirrels and other animals make sure they have enough to eat by burying nuts.

— Analyze — What behaviors help people meet their need for food?

CHAPTER 3

Adaptations to Escape from or Fight Predators

Some animals escape their predators by using **mimicry**. They mimic, or copy, another type of animal. For example, the viceroy butterfly looks like a monarch. To birds, monarchs taste bad. Birds can't tell a monarch from a viceroy, so they don't eat either one. Viceroys survive by looking like monarchs.

Other animals hide by using **camouflage**.

They are the same color as their surroundings.

For example, many female birds are brown.

That helps them blend in with the trees and bushes where they build their nests.

The Arctic fox and polar bear are both white to blend in with the snow where they live.

Chameleons can change the color of their skin to match their surroundings!

In time, nearly moths were most reduced air pollur not dark anymore weren't either. No again. We know a only because scien of the moths over

Sometimes animals must change their camouflage. For example, in England in the 1850s, nearly all of the peppered moths were mostly white with black spots. About that time, industries began to send smoke and soot into the air. The tree trunks where the moths rested turned black. Now birds easily saw the white moths—and ate them. Only the darkest moths survived and reproduced.

In time, nearly all of the "peppered" moths were mostly black. In 1956, new laws reduced air pollution. The tree trunks were not dark anymore. After a while, the moths weren't either. Now they look peppered again. We know about these adaptations only because scientists kept careful records of the moths over many years.

mimicry: behavior that copies another animal **camouflage:** coloring that helps to hide an animal from predators

— Restate — How were the peppered moths camouflaged?

Many animals escape from predators by running. An antelope, for example, can run up to 60 miles an hour.

You know that sharp claws and teeth help some animals catch their prey. These body parts also protect them from predators. Ostriches and kangaroos can kick hard enough to turn away a predator. Elk, moose, and sheep use their antlers or horns to fight off other animals. A walrus uses its tusks.

Skunks keep predators away with a really pleasant smell. Some snakes fall are he and a really impreasant smell. Some snakes, fish, and frogs have poison in their fangs or spines.

Bees and jellyfish sting.

Predator

Predators—and people—soon learn to leave these animals alone.

CHAPTER 4

Adaptations to Reproduce

Why does a **female** penguin lay only one egg, while a female frog lays hundreds of them? The male penguin keeps the egg warm on his feet for 65 days while the female leaves to find food. The male can take care of only one egg, but he takes very good care of it.

Yet after the female frog lays her eggs, both parents leave. Most of those eggs die or are eaten by fish. Only a few hatch into tadpoles, but that is enough to allow that type of frog to survive.

Penguins and frogs both reproduce in a way that is adapted to their ecosystem and their needs.

female: an animal or plant part that bears eggs or seeds male: an animal or plant part that fertilizes the eggs or seeds **reproduce:** to produce young or offspring

Why does an antelope need to be able to run really fas

Many animals have special ways to attract mates. Male fireflies flash their lights, while male peacocks spread their tail feathers and male frogs croak. In time, females come to them, and the pairs mate and produce offspring.

Plants also have adaptations to help them reproduce. The seeds of desert plants wait until a rare rainstorm before they sprout.

Dandelion seeds have "wings" that carry them away from the parent plant, so they will have room to grow.

Many flowers are brightly colored.

Many flowers are brightly colored and produce **nectar** to attract birds and insects. The birds and insects help spread **pollen** from plant to plant so that the plants can produce seeds.

Plants and animal populations are adapted in many ways to their ecosystems. Their survival depends on these adaptations. If an Arctic fox had brown fur instead of white, it would stand out in its snowy surroundings. Brown fur would make it difficult for this fox to sneak up on its prey.

White fur helps the Arctic fox survive in its icy ecosystem. Yet that same fur would lead to its death in a desert. Every living thing is adapted to its own ecosystem. What happens when that ecosystem changes? Read the next book in this series, What Happens When Ecosystems Change?, to find out!

mates: a male or female of the same kind of animal; two mates join to reproduce

mate: when a male and a female combine sex cells to produce offspring

nectar: a sweet liquid found in many flowers

pollen: the male sex cell for plants

– Summarize –

Why can organisms survive only in ecosystems in which their needs can be met?

Glossary

adapted—changed in order to fit a certain purpose camouflage—coloring that helps to hide an animal from predators

climate—the weather year-round

ecosystem—all the living things that live in a certain area

north in the spring

mimicry—behavior that copies another animal

nectar—a sweet liquid found in many flowers

organisms—any living thing

pollen—the male sex cell for plants

predators—animals that get their energy by eating other animals

prey—animals that are eaten by other animals

reproduce—to produce young or offspring

talons—claws on the feet of meat-eating birds

To Find Out More . . .

Want to learn more ways that animals adapt to their ecosystems?

Try these books

Animal Adaptations by Elizabeth Rose. PowerKids Press, 2006.

Animal Planet: The Most Extreme Animals by Discovery Channel. Jossey-Bass, 2007.

Animal Sharpshooters by Anthony D.

Animals Under the Ground by Phyllis J.

Animal Planet: The Most Extremate by Discovery Channel. Jossey-Ba

Animal Sharpshooters by Anthony Fredericks. Franklin Watts, 2000.

Animals Under the Ground by Phyll. Perry. Franklin Watts, 2002.

The male—an animal or plant part that fertilizes the eggs or seeds

mates—a male or female of the same kind of animal; two mates join to reproduce

migrate—to move south for the minute orth in the spring. Curious Critters of the Natural World:

Find out more about how animals adapt at the Online Learning Haven. www.learninghaven.com/science/articles/ animals_and_adaptation.htm

Go to the "Earth Floor" and check out the information about diversity, adaptation, and the different biomes or ecosystems on our planet.

www.cotf.edu/ete/modules/msese/explorer.html

Index

anglerfish, 14 anteater, 13 antelope, 18 4-5 Arctic, Arctic fox, 16, 21 bats, 15 bears, 10 birds, 11, 12, 13, 15 butterflies, 9, 11, 16 box jellyfish, 11 cactus, 7 catfish, 11 chameleons, 16 chipmunk, 11 cheetah, 12 dandelion, 20 desert, 4, 7 earthworms, 11 eagles, 12, 13 elk, 18 falcon, 11 fish, 12, 14 fireflies, 20 frogs, 19 gulper eel, 14 herons, 12 hibernation, 10

hyenas, 15 hummingbirds, 13 jackrabbit, 7 kangaroos, 18 migration, 9 moose, 18 peppered moth, 17
polar bears, 4, 6, 16
raccoons, 10
in forest, 5, 8
rpions, 4
*s, 11
18 moths, peppered, 17 skunks, 10, 18 squirrels, 15 tickbirds, 15 whales, gray, 9 woodchuck, 10

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Animals and Plants in Their Environment

Assessments Assessing to Survive

Print pages 20-22 of this PDF for the assessments.

Check Understanding

Shade the circle next to the correct answer or write your answer on the lines provided.

- 1. Why do some animals hibernate in the winter?
 - A to attract a mate
 - **B** to avoid predators
 - © to find food
 - (D) to adapt to the environment
- 2. Which characteristic helps a hawk find food?
 - A sense of sight
 - (B) thick feathers
 - © sharp beak
 - no sense of taste
- 3. Shedding thick fur in the summer helps some animals
 - (A) keep warm
 - **B** attract a mate
 - © stay cool
 - D hide from danger

4 . Animals have adapted behaviors that help them meet their need for food. Identify one adaptation of behavior.
19
Explain how the adaptation meets an animals need
Explain how the adaptation meets an animals need
for food.
Cores
Proposition
ol liceuse.

Check Understanding

Shade the circle next to the correct answer or write your answer on the lines provided.

- **5.** Some animals escape their predators by using mimicry. Which statement is an example of mimicry?
 - A Many female birds are brown.
 - **B** The viceroy butterly looks like a monarch butterfly.
 - © The arctic fox and polar bear are white.
 - © Chameleons change color to match their surroundings.
- 6. Scientists observed that the peppered moths in England changed their color. They recorded their observations. Over time, scientists discovered that the moths color changed back. They kept recording their observations. They wondered why the moths changed color. Why did the scientists record details about their scientific observations?
 - (A) to prove that they were doing a good job
 - B so they can make interesting documentaries
 - © to get people more interested in science
 - ① to provide evidence that supports their conclusions.

7. Polar bears have adapted to their cold, snowy environment. They have thick fur and layers of fat to keep them warm. Their fur is white allowing them to blend in with their environment. This makes it easier for them to catch prey. A polar bear would have a difficult time adapting to a desert environment.

Identify **two** reasons why a polar bear's adaptations would make it difficult to live in a desert.

1)	20.	-0	. *			
),	-10	5				

Explain why each adaptation would make it difficult.

Assessment Scoring Guidelines

- 1. Answer D is correct.
- **2**. Answer A is correct.
- **3**. Answer C is correct.
- 4. Possible answer may include:

Hyenas hunt in packs.

They work together to separate a week animal from its herd.

Bats make sounds that echo back Bats can't see, so they use these echos like radar to

They eat the ticks found on the animal's skin.

Squirrels gather and burny purificulty for the store of the s

They store food for when non is available.

- **5**. Answer B is correct.
- **6**. Answer D is correct.

7. Possible answers include:

Thick fur

Would hold in too much body heat

Layers of fat.

Would hold in too much body heat

Small ears

Would not allow enough heat to escape

White fur

Would not blend in with the desert environment making it difficult to hide from prey



Animals and Plants in Their Environment

English Language Arts-Activities

Adapting to Survive

Print pages 24–28 of this PDF for the reading activities.

Connotation and Denotation

A denotation is a dictionary definition. A connotation is an emotional meaning, which can be positive or negative. For example, you might say that a mountain climber is brave (a positive connotation) or foolhardy (a negative connotation). Here are more examples:

He was wearing a smile. (positive connotation) He was wearing a smirk. (negative connotation)

Her shoes looked inexpensive. (positive connotation) Her shoes looked cheap. (negative connotation)

Skunks keep predators away with a really unpleasant smell. (somewhat positive connotation)

Skunks keep predators away with a really disgusting smell. (negative connotation)

TRY THE SKILL

Shade the circle next to the word with the more positive connotation.

- 1. Global warming is now a ___
 - A problem

 B disaster
- 2. The hawk the pigeon.
 - (A) devoured

Shade the circle next to the word with the more negative connotation.

- 3. An eagle with poor eyesight would soon be _____
 - (A) starving
 - B hungry
- **4**. After the storm, the soil was _____.
 - A soggy
 - (B) moist

Locating Information

If you are writing a report, the Internet offers more information than one person could ever read, but you must choose your sources carefully. Here are some tips.

- 1. Avoid personal Web sites. Anyone can publish information on the Internet. No one checks to make sure the information is accurate. Many personal Web sites include a tilde sign (~) followed by someone's name or the word members, users, or people. The information in these sites might be excellent—or just someone's opinion.
- 2. Seek out sites sponsored by government agencies. (.gov), colleges and universities (.edu), or other reliable organizations.
- **3. Make sure the site is up to date.** At the bottom of the site, look for the last time it was updated. For most of your reports, the newer the information, the better.

TRY THE SKILL

Read each report topic. Then shade the circle next to Web site you would skip.

- 1. You are writing about plant adaptations. Which site would you skip?
 - (A) Introduction: Prairie Plant Adaptations
 Most prairie grasses are adapted to fire, drought,
 and...

 www.museum.state.il.us/exhibits/plantadapt.html
 - B Arctic Plant Life
 Most of the plants are small and grow close to
 the ground...

 www.saskschools.ca/~kevin/arctic/plants.html
- **2.** You are writing about hibernation. Which site would you skip?
 - (A) Use Hibernate to Conserve Batteries
 The power management features include Hibernate.
 Hibernate saves an image...

 www.microsoft.com/windowsxp/using/gettingstarted
 - ® NOVA Online / The Secrets of Hibernation Article based on a series about the American bear... www.pbs.org/nova/hibernation.html

Identify Relevant Information

TRY THE SKILL

When you are looking for the answer to a question, relevant information helps you. Irrelevant information is not helpful, at least right then.

As you answer questions, you must be able to zero in on the relevant information. For example, read this paragraph and look for the answer to this question—What happens when animals hibernate?

Others animals hibernate to survive the winter. First, they eat as much as possible. They are storing energy in their body fat. During true hibernation, the animal's body temperature drops. Its heart beats more slowly. Its breathing rate drops, too. A woodchuck's body temperature drops from 98 degrees Fahrenheit (37 degrees Celsius) to only 38? F (3? C). Its heart rate drops from 80 beats a minute to 4 or 5. Other true hibernators include ground squirrels and bats.

Sentences 2 through 6 explain what happens when animals hibernate. That is the information you need to answer the question.

The first sentence of this paragraph just introduces the main idea. The last three sentences describe how specific animals hibernate and name true hibernators. Read the paragraph below. Look for relevant information to answer this question—How does mimicry help animals survive?

Some animals escape their predators by using mimicry. They mimic, or copy, another kind of animal. For example, the viceroy butterfly looks like a monarch. To birds, monarchs taste bad. Birds can't tell a monarch from a viceroy, so they don't eat either one. Viceroys survive by looking like monarchs, which birds do not eat.

- 1. Shade in the circle next to the sentence that is most relevant in answering the question.
 - Animals mimic, or copy, another kind of animal.
 - (B) Viceroys survive by looking like monarchs, which birds do not eat.
 - © The viceroy butterfly looks like a monarch.
 - ① To birds, monarchs taste bad.

Summarize Main Ideas

To understand what you read, you must be able to identify the main ideas. Read this paragraph about desert animals.

In the desert, animals must deal with high heat and scarce water. Here, many animals live in tunnels underground and come out only at night, when it's cooler. Some animals obtain all the water they need from the plants they eat. Snakes and lizards have scales to help reduce water loss. The jackrabbit's very large

What is the main idea of this paragraph?

In this case, it's the first seed sentence is main idea is not even stated in so many words.

TRY THE SKILL

Read each paragraph. Then shade the circle next to the main idea of the paragraph.

- 1. The gulper eel, which lives a mile under the ocean's surface, is almost all mouth and can stretch open its huge jaws to eat a fish almost as big as it is. This eel can grow up to six feet long!
 - The gulper eel lives a mile under the ocean's surface.
 - B This eel can stretch open its jaws and eat a fish its own size.
 - © This eel is almost all mouth.
 - This eel can grow up to six feet long.
- 2. Tickbirds find their food by getting friendly with large grazing animals, such as cattle. They pick ticks (sucking insects) off the cattle's skin. The birds get a meal, and the cattle get rid of the ticks.
 - A Tickbirds are friendly with large grazing animals.
 - B Tickbirds pick ticks off the cattle's skin.
 - © Tickbirds survive by helping cattle get rid of ticks.
 - ① Ticks are sucking insects that bother cattle.

Answer Key

Connotation and Denotation

- **1**. A
- **2**. B
- **3**. A
- **4**. A

Locating Information

- **1**. B
- **2**. A

Identify Relevant Information Summarize Main Ideas 1. Buy 2. Ce ase With your a school license.